UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

WASHINGTON, D. C.

Forest Insect Laboratory
Portland, Oregon
July 29, 1941

MEMORANDUM ON EXAMINATION OF THE 1940-41 PINE BEETLE CONTROL PROJECT ON THE WASATCH NATIONAL FOREST--JUNE AND JULY 1941

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During the period of June 24 to July 8, several days were spent examining various phases of the Wasatch pine beetle control project. June 24 was spent on the Broadhead-Haystack unit in the upper Provo river drainage; July 1 was spent on the West Fork of Blacks Fork unit; and July 7 and 8 were spent on the Mirror Lake unit. Incidental observations were made from June 25 to 27 and on July 9 in connection with the checking of brood mortality in trees that had been experimentally treated with orthodichlorobenzene. The examinations were made in company with Mr. Clark Miles of the Regional Office and Junior Forester Bruce Groves, forest officer in charge of the control project.

Status of infestation.--The current outbreak of the Black Hills beetle in lodgepole pine on the Wasatch National Forest is by far the largest and most aggressive pine beetle outbreak in Region 4 at the present time. Control operations directed against this outbreak have now been in progress two years. In the season of 1939-40 considerable work was done, but in spite of this the beetles continued to increase. The fall survey of 1940 showed an estimated infestation of more than 45,000 trees. (See table 1.)

It was apparent from the survey that sufficient funds would not be available for the treatment of all the infested trees. Therefore, a selection of the areas to be treated was necessary. The decision was to treat the units on the north side of the forest to protect the adjoining, practically uninfested Ashley Forest, and also to treat the Mirror Lake and Broadhead-Haystack units, which are intensively used recreational areas. Hope was felt that spread from the heavily infested Ironmine and Fish Creek-Rock Creek areas would not be too great, and that treatment of those areas could be undertaken during the coming year with the object of cleaning up the entire infestation within the next year or two.

The extent of the infestation as estimated from the fall survey of 1940 and the general progress of the control work is summarized in the following table. The figures in this table were supplied by Mr. Groves, who will later prepare a comprehensive report on the entire control project. It should be kept in mind that the indicated number of treated trees are only approximations that have been rounded off for the present memorandum. Treating was still in progress on the West Fork of Blacks Fork and on the Mirror Lake units when the figures were obtained.

Table 1

Unit	Estimated No. Infested Trees	Estimated Acreage	Approximate No. Trees Treated 1940-41
Smiths Fork	1,527	16,968	1,600
East Fork of Blacks Fork	7,442	14,042	7,000
West Fork of Blacks Fork	3,040	11,904	3,000
Broadhead-Haystack	2,875	10,960	2,000
Mirror Lake	1,254	4,480	600
Ironmine	16,704	5,800	3,300 (300 acres only)
Fish Creek	2,408	3,440	No treating
Rock Creek	9,184	5,850	" "
Squaw Creek	547	2,880	" "
Corral Creek	685	500	" "
Total	45,666	76,824	17,500

Spotting.--The evidence noted in the field indicates that there has been a marked improvement in the quality of the spotting work since the 1939-40 season. This is true of the work both by the survey crews and by the crews locating trees for treatment. In spite of this improvement, it is believed that the standard, especially of the survey crews, can and should be raised still higher.

Certain conditions present on the Wasatch tend to make estimating a difficult undertaking. Infestation occurs in a number of relatively small, isolated units and as a result a number of individual estimates are necessary. The units are chiefly long narrow ones extending along streams. Often there is marked local variation in intensity of infestation. The timber type is also notably lacking in uniformity. Under such conditions much depends upon the experience and judgment of the spotters in determining whether the strips are representative and whether the estimates are reasonable. Unfortunately up to the present time it has been necessary to use rather inexperienced crews.

A factor that affects the estimates and is also of importance in the marking of trees for treatment is the occurrence of "marginal bug trees". These trees, which are variously known as "strip kills", "pitch outs", and "basal attacks", may or may not produce pine beetles. In some cases fewer beetles are produced than the number that enter the trees. In other cases apparently normal broods emerge from the attacked portions. On the Wasatch the problem of which marginal trees to treat and which to leave was a serious one, especially in the Broadhead-Haystack unit where "strip kills" of large trees were prevalent. Some lack of uniformity in the marking of such trees resulted. It is probable that such trees also influenced the estimates to some degree.

Missed trees while occasionally encountered, as they may be on any large control project, did not appear much more numerous than would normally be expected.

Whatever the shortcomings of the spotting may have been, they probably developed from the necessity of having to use inexperienced spotters. A limited amount of instruction was given by D. A. Hester, and men so instructed acted as instructors for others. Now the men on the project have had valuable experience and it is hoped that most of them can be used again during the coming season. It is also hoped that additional instruction can be provided. A spotters' school of several days' duration this fall would be very helpful.

Control work.—Perhaps the outstanding feature of the Wasatch control project during the past season was the number of difficulties encountered and overcome. While these difficulties did not result in a lessening of the quality of the work, they undoubtedly did affect the cost of treating.

One of the first and most serious problems was that of obtaining sufficient labor. For the most part only inexperienced men could be obtained and even those with difficulty. The use of such labor made it necessary to set up a careful system of checks to make sure that the treating was carefully done. Perhaps it could be argued that too much time was spent in an effort to get the last beetle in each treated tree, while many thousands of trees had to be left untreated in other units. This course, however, may be justified on several scores. As already noted, the careful supervision of the available labor was essential to avoid slipshod treatment. The training of these men in careful technique should provide a valuable nucleus for future control crews. By cleaning up the areas intensively, it is hoped that infiltration from adjoining areas may not be great and that by so doing only limited cleanup measures will be necessary.

Weather played an important role in the operation. Deep snow during the winter made it necessary to shut down for several months. Upon resumption of work in the spring, unusually late storms kept the roads all but impassable until late in June. When the change to the ortho and oil method was attempted, heavy rains in late June and early July caused much difficulty by making it necessary to use both the burning and the ortho and oil methods, when either one or the other would have been cheaper.

The nature of the infestation also influenced the work. As has been mentioned, the outbreak is divided into a number of isolated units. Consequently, frequent making and breaking of camps was necessary. Each move was attended with considerable difficulty because of the weather conditions.

So far as the actual control is concerned there is little to comment upon, except to state that it was good. The felling and burning on the north side, as exemplified by that on the West Fork of Blacks Fork, appeared very thoroughly done. In the Broadhead-Haystack unit somewhat more opportunity for individual opinion was given the treaters and consequently the treatment, while thorough, did not get the "last beetle" in all cases. Under the circumstances, the more arbitrary method followed on the north side is considered preferable.

Only limited opportunity was available to see the ortho and oil method of treatment in operation. On July 1 the use of this method had just begun on the West Fork of Blacks Fork unit. Several trees treated the day previously were examined and found to contain only dead brood. In the Mirror Lake unit on July 7 and 8 a considerable series of trees that had been treated from 1 to 7 days was examined. In all cases where the trees had been treated more than one day, 100 per cent mortality was found. In trees treated only 1 day, mortality was heavy but some living brood was noted. This extremely rapid effect indicated that the ortho and oil method is applicable right up until time for the beetles to emerge, for the adults appear to be as readily affected as the larvae and pupae.

Two shortcomings of the ortho and oil method were noted. Rain or snow soon wets the bark so that it is impossible to tell with certainty whether a log has been fully treated. In fact after heavy rains such as were common on the Wasatch in early July of this year it is impractical to use this method until the bark dries out. Also the ortho and oil treatment is very much harder to check than the felling and burning method, for it is much more difficult for the treaters to "see" the results. There is the constant danger of relaxation on the part of the treaters, for as the treating progresses there is a tendency to hurry the process and get on to the next tree. There is need of a study to determine the best method of progressively checking the work under this method.

Brood conditions.—So far as brood conditions were concerned it was readily apparent that treating could safely be continued until the time (July 15) set for termination of the project. In fact treating very likely could have been continued until August 1. In the West Fork of Blacks Fork Unit only larvae were found in the trees examined, although there were reports that some newly formed beetles had been found by the treaters. In the Broadhead-Haystack and Ironmine units pupae were found during the period of June 24 to 27. Only larvae and pupae were also found in the Mirror Lake unit on July 7 and 8. The only new adults seen by this observer were a few on July 9 in one tree along the Soapstone utilization road. This tree had been felled on June 26, at which time it contained only larvae and pupae.

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